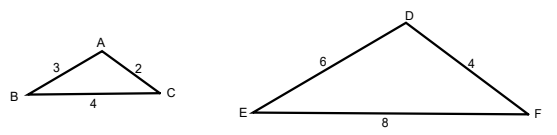


Similar Triangles

When two triangles have the same _____ but different _____, they are similar.

⇒ This means that: corresponding angles are _____ and the _____ of corresponding sides are _____.

The symbol \sim means "is similar to".



$\triangle ABC \sim \triangle$ _____ **Order of letters matters!

$\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$

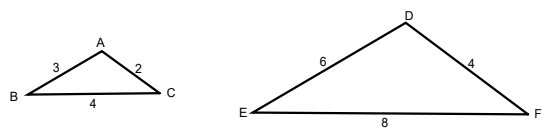
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Similar Triangles

When two triangles have the same angles but different magnitude, they are similar.

⇒ This means that: corresponding angles are equal and the pairs of corresponding sides are proportional.

The symbol \sim means "is similar to".



$\triangle ABC \sim \triangle DEF$ (SSS) **Order of letters matters!

$\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$

$\frac{3}{6} \sim \frac{2}{4} \sim \frac{4}{8}$

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Conditions for Similarity

1) SSS (_____ - _____ - _____)

If three _____ of corresponding _____ are proportional, then the triangles are similar.

2) SAS (_____ - _____ - _____)

If two _____ of corresponding sides are _____ and the _____ angles are _____, then the triangles are similar.

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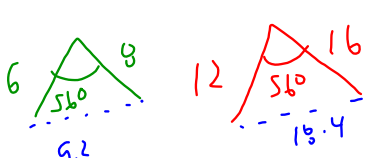
Conditions for Similarity

1) SSS (side side side)

If three Sides of corresponding triangles are proportional, then the triangles are similar.

2) SAS (side angle side)

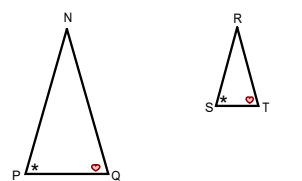
If two lengths of corresponding sides are proportional and the Contained angles are equal, then the triangles are similar.



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3) AA (_____ - _____)

If two _____ of corresponding angles are _____, then the triangles are similar.



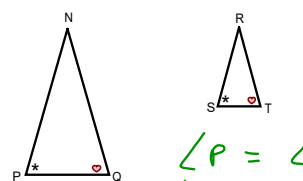
$\triangle NPQ \sim \triangle$ _____ OR $\triangle NPQ \sim \triangle$ _____

Write the "proportion statement":

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3) AA (angle angle)

If two magnitudes of corresponding angles are equal, then the triangles are similar.



$\angle P = \angle S$
 $\angle Q = \angle T$

$\triangle NPQ \sim \triangle RST$ OR $\triangle NPQ \sim \triangle RST$

Write the "proportion statement":

$\therefore \triangle NPQ \sim \triangle RST$ because (AA)

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Example 1)

A metre stick casts a shadow of 1.6 m. At the same time, a tree casts a shadow of 18.1 m. How tall is the tree to the nearest tenth of a metre?

Diagram:

***ALWAYS START WITH SIMILARITY STATEMENT IF IT IS NOT GIVEN.
***THEN, WRITE PROPORTION STATEMENT.

The tree is 11.3 m tall.

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Example 1)

A metre stick casts a shadow of 1.6 m. At the same time, a tree casts a shadow of 18.1 m. How tall is the tree to the nearest tenth of a metre?

Diagram:

***ALWAYS START WITH SIMILARITY STATEMENT IF IT IS NOT GIVEN.
***THEN, WRITE PROPORTION STATEMENT.

$$\triangle ABC \sim \triangle DEF \text{ (AA)}$$

$$\frac{BC}{EF} \sim \frac{AB}{DE}$$

$$\frac{1.6}{18.1} \sim \frac{1}{x}$$

$$1.6x = 1(18.1)$$

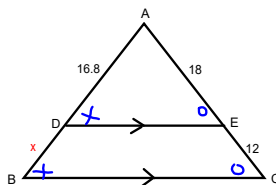
$$\frac{1.6x}{1.6} = \frac{18.1}{1.6}$$

$$x = 11.3$$

The tree is 11.3 m tall.

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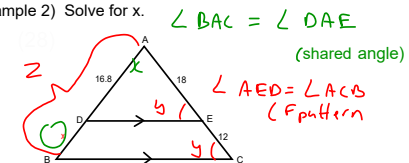
Example 2) Solve for x.



Need: Similarity Statement $\triangle \underline{\hspace{1cm}} \sim \triangle \underline{\hspace{1cm}}$

Need: Proportion Statement

Example 2) Solve for x.



Need: Similarity Statement $\triangle ABC \sim \triangle ADE$
(AA)

Need: Proportion Statement

$$\frac{AE}{AC} \sim \frac{AD}{AB}$$

$$\frac{18}{30} \sim \frac{16.8}{x}$$

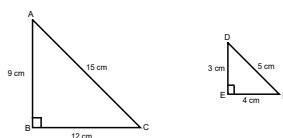
$$18x = 504$$

$$x = 28$$

$$x = 28 - 16.8 = 11.2$$

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Example 3) In the diagram below, $\triangle ABC \sim \triangle DEF$



a) Write the proportion statement:

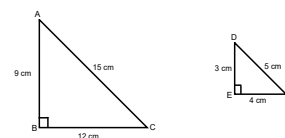
b) What is the "scale factor"?

c) Calculate the perimeter of each triangle.

d) Calculate the area of each triangle.

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Example 3) In the diagram below, $\triangle ABC \sim \triangle DEF$



a) Write the proportion statement:

$$\frac{AD}{DE} \sim \frac{BC}{EF} \sim \frac{AC}{DF}$$

$$\frac{9}{3} = \frac{12}{4} = \frac{15}{5}$$

b) What is the "scale factor"?

$$\frac{3}{1} \therefore \triangle ABC \sim \triangle DEF \text{ (SSS)}$$

c) Calculate the perimeter of each triangle.

d) Calculate the area of each triangle.

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